

During the month we have stopped in Taluit I have had, on account of other work, very little opportunity of collecting birds myself; but I have sent out native hunters, who are very well acquainted with the animal-life generally, to collect. As might have been expected, the avifauna of these low coral islands is very poor. Along the beach one observes in small numbers *Anous melanogenys*, and a few examples of *Gygis candida*, *Actitis incana*, and *Ardea sacra*. Of the last-named bird I noticed dark ones in pairs, and dark ones paired with white-spotted individuals. They are now in moult; and so are *Strepsilas interpres* and *Numenius femoralis*.

Of both the last-named species I got specimens, caught by hand, having lost all their primaries. All the Turnstones were still in their summer plumage. Besides these I got *Anous melanogenys* and *Sterna melanauchen*, both in moult, *Charadrius fulvus* and a young *Carpophaga* which had just left the nest, apparently *C. oceanica*. Twice I have observed a *Eudynamis*, making the total number of birds received up to this time ten; but a native chief has furnished me with the names of sixteen species known to occur here.

I hope shortly to leave this island for the west; but there being no regular means of transit, I am quite unable to say where I shall go first or when.

XIX.—*Notes on the Avifauna of the Loyalty Islands.* By
EDGAR L. LAYARD, C.M.G., F.Z.S., &c., H.B.M. Consul,
and E. LEOPOLD C. LAYARD, Vice-Consul at Noumea.

THE following "Notes" on the avifauna of the Loyalty Islands are written to replace a similar paper, unfortunately lost, which was transmitted to the care of our kind coadjutor Canon Tristram in October of last year, together with the collection of specimens on which he has founded his "Notes" at page 180 of the volume for 1879.

Fortunately Canon Tristram was enabled, having the specimens and our letter, to publish our new discoveries, and point out the specialities we desired; and we owe our best thanks to the Editors of 'The Ibis' for the charming and life-like plates of several of our novelties.

With the aid of notes made on the spot, we will now endeavour to give an idea of the ornithology of the Loyalties; but we must beg the indulgence of our readers if the freshness of descriptions written at the time should be wanting.

We must refer our brethren of the B. O. U. to the pages of the 'Field' for a full description of Lifu*. Suffice it to say, it is one of a group of islands to the eastward of New Caledonia, and about one third of the distance between it and Tanna, the nearest of the New Hebrides. In shape it is something like the chess-piece called the "knight"—a broad lump of land for the base, then a long neck, and finally a head-shaped piece. On this last, just under the chin, is situated the mission-station and village of Kepenché, where we stayed and collected. The whole of the island is flat, and mostly covered with fine forest. It is between forty and fifty miles long by half as much in breadth, and rises gradually in some parts to about 200 feet above the sea, from which it has been uplifted by successive upheavals, evidences of which are very apparent in the parallel lines of the water-worn cliffs. The whole island, according to the information we gathered, is formed of recent limestone, or altered coral, crystallized probably by heat below the surface of the water. The rock is honeycombed in a most remarkable manner; and many existing corals, madrepores, and shells are embedded in it. Vast caverns—bubbles done in stone, exist all over the island, some known and visible, more unknown, save by the hollow sound beneath one's feet. All the water used is obtained from these, or from wells dug in the rock, through which water filters; it is therefore all more or less brackish.

To the north lies a group of islands chained together by an encircling reef, known by the name of Uvéa. This, we learnt, was a great home of sea-fowl. To the south is another island, Maré, a solid block of land, which possesses, as we now know, a peculiar Blackbird, *Turdus mareensis*, nobis (Ibis, 1879, p. 472).

Pine trees crown most of the taller headlands, such as the bluff of Nikitipu (lit. "the ship in sight"), near Ke-

* See E. L. Layard's "Zoological Notes from New Caledonia," in the 'Field' of Dec. 28, 1878 (vol. lii. p. 828).

penché; but the forest generally is of the ordinary timber of New Caledonia, the ground beneath, if not carpeted with ferns and lycopods, bare of vegetation and easily traversed.

Having thus described the ground, let us now particularize the species obtained, or seen, by us in the two trips made (one by each of us) to Lifu. L. L. was on Maré for a few hours, but not long enough to do any work. We hope some day to be able to work it and Uvéa in a thorough manner; but the difficulty of locomotion precludes our visiting many localities that we much desire to see. Some day also we hope to reach the "Isle of Pines," where, we hear, birds are abundant.

1. UROSPIZIAS APPROXIMANS (V. & H.).

Not uncommon; several specimens in various stages of plumage were procured. Canon Tristram remarks (*loc. cit.*) that "if the sexes are correctly marked, [our] examples are considerably smaller than specimens from Tasmania in length of tarsus, tail, and wing." We can only say that the sex of all our specimens is carefully determined by us, a magnifying-glass being often used for this purpose, and that we have one solitary very old female fully as large as any described from Australia.

These birds, in Lifu, are a great scourge to the hen-yards; here, on New Caledonia, we have chiefly found reptiles in their stomachs. We have lately (August 23, 1879) obtained a young one just able to fly. Some of our young specimens from Lifu are so singularly rufous that we at first thought we had a new species. Native name "Wakoon" or "Uzu."

2. STRIX DELICATULA, Gould.

A single specimen was brought to us alive, out of which the captor had pulled all the wing-primaries, to adorn his beautiful woolly head! He was very indignant when we would not buy the bird at his price, but finally consoled himself by saying it would make good "kai-kai" (food), and carried off his victim blinking and snapping all round! Lifu, "Méa;" Maré, "Mené."

3. *STRIX NOVÆ-HOLLANDIÆ*, Steph.

In the Lifu collection alluded to in a previous paper, appeared a solitary specimen of this bird. From the "make up" of the skin, having restuffed it, we are now sure it is a genuine Lifu production, though at first we doubted it.

4. *COLLOCALIA UROPYGIALIS*, G. R. Gray.

The White-bellied Swiftlet is the common species in Lifu, where it is called "Phiphica." It breeds in the caverns hollowed out by the sea in the limestone rocks. One such cavern is not far from the "Residency;" into this a man may wade at low tide a considerable distance. The Swiftlets were not breeding in September.

5. *COLLOCALIA LEUCOPYGIA*, Wall.

The Grey-bellied Swiftlet, though noted by both of us, is far more rare in Lifu than the previous one. This, we presume, arises from the fact that it is not so partial to the forest, but prefers open grass-country. The natives do not discriminate between the two species.

6. *COLLOCALIA CINEREA* (Gmel.).

Only one specimen of this rare species fell under our notice. E. L. L. was walking one morning along the Yasso road; a Swiftlet came skimming along towards him, almost touching the ground. As it approached, E. L. L. noticed its large size; but before he could get a shot at it, the bird turned off at right angles into the bush, affording a full view of its uniform back and rump. Though the road was traversed for several mornings in hopes of again seeing the bird, it never reappeared. Recent letters from L. L. show it is not uncommon on Vaté, New Hebrides, where he procured it before.

7. *HALCYON SANCTA*, V. & H.

Not uncommon. Lifu, "Chichiaté;" Maré, "Théthé."

8. *MYZOMELA LIFUENSIS*, Tristram, Ibis, 1879, p. 186.

This new species entirely replaces *M. caledonica*, Forbes, on Lifu, where it is called "Thulumaddey" (on Maré a similar or closely allied species is called "Wassissichou"). It is

found, but not at all commonly, equally in the dense woods and native gardens, eagerly plunging its long bill into the flowers of the forest-trees or the bunches of banana-blossoms. One shot had its head so covered with red pollen as to appear for a moment, until the colour came off on our fingers, a new species! We subjoin the colour of the soft parts:—Bill black; legs and feet very dark brown, with pale yellowish soles; iris dark brown. It has a loud shrill note.

9. GLYCYPHILA SATELLES, Tristram, Ibis, 1879, p. 185.

Our reverend friend must stand the full brunt of the battle in describing the Lifu *Glycyphila* as a new species! As far as we can see, we cannot separate the birds from New Caledonia and Lifu into more than two species, *G. fasciata* (Forster) and *G. chlorophaea* (Forster). Under the last name we think all the species proposed by Gray and others must be placed, as the differences are due to age, sex, and season. We have slaughtered so many that our conscience pricks us, though we have faithfully skinned every bird. In measurements and coloration hardly any two are alike.

G. fasciata does not exist in Lifu. The species found there is called “Sissi.”

10. PHILEMON LESSONI, G. R. Gray.

Decidedly scarce in Lifu, where it is called “Kuchalu,” and on Maré “Kutti.” It occurred to both of us, but very sparingly.

11. ZOSTEROPS INORNATA, Tristram, Ibis, 1878, p. 259.

The two “White-eyes” of New Caledonia are entirely replaced on this island by three totally different species—one probably the largest, another the smallest, and the last the prettiest species of this extensive genus!

The species under consideration is the giant of the tribe; it may be equalled by the Lord-Howe’s-Island bird; but that we have not yet seen. We can add nothing to the information conveyed in our letters quoted at pages 186, 187, except the native name, “Cinnaming” (Maré, “Wāsisi”), and the colours of the soft parts:—Upper mandible and point of lower dark

corneous, base of lower whitish; legs and feet pale salmon-colour; iris dull crimson-brown. Length in the flesh 6".

It haunts the forest, chiefly frequenting the high trees; indeed we never saw it much in the gardens. Those caught by the boys with their snares (see 'Field') were all captured in or near the forest. Note like that of a *Pachycephala*.

12. *ZOSTEROPS MINUTA*, Layard, Ibis, 1878, p. 259.

This pretty minute species was found to be very common, and easily distinguishable by its bright colour, and especially the white spot on the flank, which is not enough shown in the plate (Ibis, 1879, pl. iv.). It is called "Watchu-mandra," and on Maré "Washosso." They are frightfully destructive to fruit of all kinds, and travel in large flocks. Iris drab; bill corneous, base of lower mandible whitish; legs and feet plumbeous brown. Length 4" 3".

13. *ZOSTEROPS MELANOPS*, G. R. Gray.

This lovely species was brought in among the first batch of "White-eyes" caught by the native boys; but though I offered a special price for them, and devoted several days entirely to pursuing them, very few were obtained. It moves about singly or in pairs; and my little native companion, Wanapo (otherwise "Puss-in-boots"!), could always distinguish it by its voice, which he imitated by a single high piercing whistle, followed by a low "churring" note, made by blowing on the edge of a leaf. The "Ehatahou" would then generally show itself in some dense bush, and come to grief. It did not occur to L. L., and must be rare.

Length 5". Iris yellow or brown-drab; bill corneous, lower mandible whitish; legs and feet pale greenish brown. It is the most elegant of all the White-eyes with which I am acquainted (E. L. L.).

14. *GERYGONE FLAVOLATERALIS* (G. R. Gray).

Found sparingly, not nearly in such abundance as in New Caledonia. Native name "Fitchikoo." Not known to the Maré boys.

15. *TURDUS PRITZBUERI*, Layard, Ibis, 1878, p. 254; Tristram, Ibis, 1879, p. 187, pl. v.

The New-Caledonian *T. xanthopus* does not exist in either

Lifu or Maré. In the former it is replaced by the small but handsome species under consideration, in the latter by a still smaller species, *T. mareensis*, L. & T., newly described in 'The Ibis' (1879, p. 472).

T. pritzbueri is a most shy and wary species, and occupied our native hunter in his "nature's garb" all his time to steal on them. The least snap of a twig or rustle of a dry leaf, and away goes the suspicious quarry! Some idea of the wariness of the allied *T. mareensis* may be inferred from a letter from our kind correspondent, the Rev. Mr. Jones, in which he says that, though he has had three men out for five days hunting especially for them, he has only been able to get one specimen! We succeeded better with *T. pritzbueri*; but it was always difficult of approach.

We found males and females in full breeding-στοργή in the middle of August, and also fully fledged young birds in the spotted plumage of the well-known European bird. Total length in the flesh 8" 9". Iris darkish drab; bill and feet bright orange-yellow, as is the eyelid, which unfortunately is not properly coloured in the Plate, one result of the unlucky loss of our previous paper.

The thighs of this bird are very stout and powerful, enabling it to progress over the ground in huge bounds. If a bird is only broken-winged, he is pretty sure to escape in the underwood. It is called "Wathitha," the Maré bird being known under the appellation of "Wassassé" on its own island. They feed on insects and worms, and are very fond of searching about the deserted native plantations. We never heard them sing; but they invariably utter the well-known metallic *chinck, chinck, chinck*, when hurriedly taking flight on being alarmed.

16. ARTAMUS MELALEUCUS (Forst.).

The Wood-Swallow is found sparingly in small parties, and occurred to both of us. Lifu, "Khat."

17. MYIAGRA LUGUIERI, Tristram, Ibis, 1879, p. 188.

This and the next species, *M. intermedia*, L. & T., replace *M. viridinitens* and *M. caledonica* on Lifu. In habits and

note they are similar, but may at once be separated from them and the two New-Hebridean species by the coloration of the tail, forming, as pointed out in Canon Tristram's previous paper and in the 'Field,' most interesting intermediate links.

Our friend informs us that doubts are entertained as to the distinctness of the *black-* from the *red-breasted* species. All we can say is that we have carefully determined the sex of numbers of all the species from New Caledonia, Lifu, Tanna, Vaté, &c. &c., procured at all seasons; I have found both males and females of *each* in full breeding-*στοργή*. We would also remind the doubters that in Samoa the only species known (the *M. albiventris* of Peale) is a *red-breasted* bird, closely resembling those under consideration, and a *black-breasted* one is never seen there.

Length in the flesh 6" 9". Lifu, "Chichiwhat;" Maré, "Wanirekkoe." We have named this species after M. Luguier, the French "resident" or governor of the Loyalty Islands.

18. MYIAGRA INTERMEDIA, Tristram, Ibis, 1878, p. 189.

In habits and note similar to the preceding, and goes by the same name among the natives. They both frequent open forest, darting upon minute insects, whether on the wing or at rest on leaves. This red-breasted species is not so common as the black one; and neither of them is very abundant. They betray their presence by a loud stridulous cry, and have a curious tremulous motion of the tail, which is generally shown on alighting on a spray, after a forage in search of their prey.

19. RHIPIDURA VERREAUXI, Marie.

20. RHIPIDURA BULGERI, Layard.

Both these Fantails were observed, sparingly, on Lifu, where they are much rarer than on New Caledonia. The former is called "Eniyana" (restlessness), from its continual motion. We could not find any name for the smaller bird.

21. GRAUCALUS LIFUENSIS, Tristram, Ibis, 1879, p. 190.

This Palm-Crow, as it is called, is at once distinguishable from its congener on New Caledonia (*G. cinereus*) by its hue. The instant we shot our first specimen we perceived the dif-

ference in tint, even without a bird from the larger island to compare with it. The bill is corneous, lower mandible the palest; legs black; soles of feet dull yellow; iris pale yellow. Length 14". It preys upon *Gryllæ* and such like insects, Coleoptera, ants, &c., also on fruit. We found it equally among the cocoa-nut groves and the high forest-trees. The natives say its favourite food is the large locust (*Locusta imperialis*) that devours the leaf of the cocoa-nut tree. They call it "Halou," and say that it does not exist on Maré, where the locust abounds. On suggesting that it might be easily introduced, we were told that the inhabitants preferred the insect, the female of which, a fly of six or seven inches length, and when in season full of eggs the shape, size, and colour of green oats, is much sought after as an article of food, and said, even by a white man, to be "delicious," resembling potted shrimps!! It probably never existed on Maré, as the natives of that island have no name for it.

Canon Tristram alludes to a *Graucalus* from Mallicolo Island, New Hebrides, obtained by L. L., as differing in tint from *G. cinereus*, being *greener*. Lately, when looking over our collections, we placed a specimen from "Espirito Santo" alongside the latter, and were struck by the *lighter* and *bluer* tint prevailing over it. We suspect these are all local races, gradually changing into what will hereafter be good species.

22. LALAGE MONTROUSIERI, Verr. et DesM.

Found equally on Lifu and Maré, and called respectively "Wanunu" and "Kaddi."

23. PACHYCEPHALA LITTAYEI, Tristram, Ibis, 1878, p. 255; Tristram, Ibis, 1879, p. 190, pl. vi.

Peculiar to Lifu, to the total displacement of *P. moriariensis* and *P. assimilis*, Verr. & DesM. These two, and also our two New-Caledonian *Eopsaltriæ* (*E. caledonica* and *E. flavigastrea*), are conspicuous by their absence! This fine species, far exceeding in size those of the main island, is found only in the forest, keeping chiefly to the undergrowth, which it traverses in search of its favourite food, snails of the genus *Helicina*, which were never absent from the stomachs of those killed by us. The female is far scarcer than the male, or,

rather, is more difficult to find. The latter is so pugnacious that, on its call being imitated, which it is easy to do by a whistle, it instantly flies to the sound to attack its fancied rival. In this way E. L. L. once shot four in a little patch of wood not twenty yards square, cut off from the main forest by cross roads. In this we concealed ourselves and commenced calling, when the challenge was taken up and responded to on four different sides, and one after another the gorgeous yellow breasts succumbed.

It feeds on Coleoptera, small snails, flies, and ants, on which it darts while at rest on the underside of leaves or branches. Males were in full breeding-*στοργή* at the end of August; perhaps the females were sitting, and this may partially account for their scarcity. Length 7" 10". Bill black; legs and feet purplish brown (in female fleshy brown); iris dull dark crimson. Native name "Thuthu." All our informants declared no such bird existed on Maré; and from its conspicuous colour and note, it could not fail to be noticed if it had been there.

24. *APLONIS ATRONITENS*, G. R. Gray.

We were very pleased to find this fine Starling in considerable numbers, replacing the New-Caledonian *A. caledonica*; which, however, we believe, does occur on the island sparingly, though it did not fall under our own observation, but was marked from Lifu in the old collection before alluded to.

It is called "Zeakheta" ("Koho" on Maré, if identical), and is partial to perching on the summits of tall dead forest-trees, roving in flocks, and feeding on berries of all kinds, especially those of the banian. Length 9". Bill and legs black; iris orange. The young male resembles the female until the first moult. We have little doubt Mr. Gray described from a young bird, and that he and others have done so in more instances than one among these *Aplones*, and that all the species described from New Caledonia, viz. *A. nigro-viridis*, Lesson, *A. viridigrisea*, Gray, *A. atronitens*, Gray, *A. caledonica*, Bp., *A. striata*, Gmel., and *A. pacifica*, Forst.,

are founded on the sexes and seasonable changes of two species. Gmelin's name, if it can be shown to which species it refers, must have priority over *atronitens* of Gray, and *caledonica* of Bonaparte.

25. *ERYTHRURA CYANEIFRONS*, Tristram, Ibis, 1878, p. 260.

This pretty species, which takes the place of *E. psittacea* of New Caledonia, is found about the native gardens, but very sparingly. It feeds on grass-seeds, and generally flies in small flocks or families of five or six or seven. It is very shy and wary, and on being pursued quits the spot and seldom returns to it. Length 4" 9". Iris very dark brown; legs and feet brown; bill black. Has a shrill piercing note, like *E. psittacea*. Native name "Finifi."

Lieut. Richards, commanding H.M.S. 'Renard,' and L. L. found this species in Tanna, where L. L. also procured *Turdus pritzbueri*.

26. *CUCULUS BRONZINUS*, G. R. Gray.

Occurred to both of us on Lifu, but is more often heard than seen. It is called "Zeug" We found young in the striped plumage and adults in full breeding-dress at the end of August. They feed on a reddish hairy caterpillar, and utter a shrill clear piping whistle.

27. *CHALCITES LUCIDUS* (Gmel.).

We had identified the species frequenting New Caledonia and Lifu with *C. basalis*, Horsf., being guided by Mr. Gould's 'Birds of Australia,' and having only a single New-Zealand specimen to compare with our birds. It will be interesting to clear up this point, as it may indicate the true range of the New-Zealand species. We have lately, in August and September, shot several specimens containing eggs ready for exclusion. A breeding female was obtained in Lifu on the 25th of August. The natives recognize its affinity to the preceding, and call it also "Zeug."

28. *TRICHOGLOSSUS MASSENÆ*, Bp.

Hearing much of a Parrot found in the interior of Lifu, we despatched a hunter expressly to procure it. He returned with

half a dozen specimens of the species, which he called "Si-watta," a name, we think, taken from its cry. All declared that it was replaced on Uvéa by the crested species, *Nymphicus cornutus*, which they perfectly described, and called "Pugin," and they concurred in saying that neither of them was found on Maré.

29. *PTILOPUS GREYI*, G. R. Gray.

Very abundant on Lifu; in full breeding in August; eggs pure white (but *cf.* Ibis, 1876, p. 264, where Canon Tristram's correspondent sends eggs of a "dark cream-colour, darker than *Æna capensis*;" surely there must be some mistake here. Eggs ready for exclusion taken from birds shot here, in New Caledonia, are also pure white (E. L. L.). Native name "Pin," Maré, "Denné."

30. *IANTHÆNAS HYPÆNOCHROA*, Gould.

Not very common on Lifu, where designated "Mékketta," on Maré "Mécetché." Only found in the forest, feeding on banian and other berries.

31. *CARPOPHAGA ÆNEA*, G. R. Gray.

Our hunter, Cano, spoke much of a large Pigeon, which he accurately described and called "Puni," which we have no doubt was this species, several of which, labelled from Lifu, were in the old government collection, but so destroyed by moth as to be utterly unfit for placing in any cabinet. Cano stated that they were migratory, though a few were to be seen during the dry season, but utterly unapproachable (!), their sense of hearing being so acute that the least noise startled them; during the wet season the damp leaves would not rustle, and he could always get at them. He tried hard to secure us a single specimen, but failed.

September 22nd. We have just heard of a specimen having been killed yesterday close to Noumea; our informant, a young lad, especially noted the crimson bill and the *round knot* on it, which had attracted his attention, not having seen any thing like it before. He endeavoured to purchase it for us from the man whom he saw shoot it; but he would not sell it.

32. *CHALCOPHAPS CHRYSOCHLORA*, Gould.

Very common on Lifu, frequenting roads and open spaces. In rainy weather, the natives say, they quit the forest and feed only on the roads, to avoid the drops falling from the trees. At such times they snare them in great numbers, by means of nooses placed in the paths. They call them "Milli-malla," and on Maré "Näinatha." They are said to be equally abundant there, and also on the Isle of Pines, whence we have seen large numbers brought up in baskets.

33. *CHARADRIUS FULVUS*, Gmel.

Said to be found in great numbers on the reefs at Uréa, but is scarce at Lifu, probably from the absence of suitable shores on which to feed.

34. *HERODIAS NOVÆ-HOLLANDIÆ*, Gould.

Found sparingly along the shore, and called "Ketté-naugetha," *i. e.* the "Ketté of the salt water."

35. *HERODIAS SACRA* (Gmel.).

E. L. L. saw, but did not obtain, a Heron which he identifies as of this species.

36. *LIMOSA UROPYGIALIS*, Gould.

Maré. The natives confuse this with the next species, and call them both "Thea."

37. *ACTITIS INCANA* (Gmel.).

At Kepenché the shore was not at all adapted for Waders; nevertheless both these species were obtained. The natives say the coral chain of Uvéa swarms with Waders and waterfowl.

38. *PORPHYRIO VITIENSIS*, Peale.

This is the "Ketté" of the fresh water, and is found sparingly on those parts of the island where the forest is replaced by grass. The natives say it never flies; they catch it with dogs.

39. *RALLUS PECTORALIS*, Cuv.40. *ORTYGOMETRA QUADRISTRIGATA*, Horsf.

The natives spoke much of two other species of "Ketté"

that they called "Thoin," affirming that they skulked in the grass, and could hardly be pushed to flight. On E. L. L. producing specimens of these two birds, they instantly recognized them with a shout of delight.

41. *ANAS SUPERCILIARIS*, Gmel.?

Ducks are sometimes seen, probably of this species.

42. *STERNA GRACILIS*, Gould.

Gulls and Terns were nearly absent from Lifu while we were there, but, as we were told, were in abundance on Uvéa, and sometimes visited Lifu in large flocks. They are all lumped together under the name of "Maal." We thought we made out

43. *STERNA VELOX*,

44. *STERNULA NEREIS*, Gould,

45. *LARUS NOVÆ-HOLLANDIÆ*, Shaw,

in the neighbouring seas. Of *Sterna gracilis* a young specimen existed in the old collection, marked from Lifu.

46. *PHAETON RUBRICAUDA* (Gmel.).

This bird, of which we saw several flying over the island, is called also "Maal."

47. *TACHYPETES AQUILUS* (Linn.).

Called "Wetté." Seen in company with the previous species. Said to come inland from Uvéa during tempestuous weather.

48. *SULA PISCATOR*, Linn.

A single specimen of this Gannet was driven inland a short time before the arrival of E. L. L., to whom it was presented as a "great curiosity," never having been seen before. It was skinned by the interpreter of the Residency, who had on a previous occasion watched L. L. preparing some birds. It is the only one that has fallen under our notice from these seas.

We should be ungrateful in concluding these "Notes" on the ornithology of the Loyalty Islands did we omit to record the kind hospitality of the Rev. Mr. Sleight, the Protestant Missionary, and of Mr. Wright, a settler at Kepenché. Our

time was spent under their sheltering roofs; and both were indefatigable in obtaining specimens for us, interpreting with the natives, and getting us the vernacular names. The latter were never recorded without severely testing their accuracy by examining several individuals.

Of the pleasant month we spent rambling amid the beautiful woods of Lifu, how we turned our good-natured friends' houses into "shambles," how we got shaken out of bed by earthquakes, &c. &c., are they not written in the pages of the 'Field' newspaper?

XX.—*Remarks on Dr. Gadow's Papers on the Digestive System of Birds.* By W. A. FORBES, B.A., F.L.S., Professor to the Zoological Society of London.

DR. HANS GADOW, who is already known as a worker at the anatomy of birds from his papers in the 'Journal für Ornithologie,' has lately published in the 'Jenaische Zeitschrift' an elaborate article on the anatomy of the digestive organs of birds*. This paper, in two parts, extends over more than 140 pages, and is illustrated with nine plates.

In the first part Dr. Gadow gives a descriptive account (without histological details) of the alimentary canal and its appendages—tongue, liver, pancreas, cæca, &c., as well as of the kidneys, which he strangely includes with these organs—in the various orders of birds, in large part based upon his own investigations. I cannot always agree with Dr. Gadow in his grouping of the various forms together, as, *e. g.*, including such different forms as Auks, Penguins, and Grebes in the same order, "Pygopodes."

For this part of his work Dr. Gadow seems to have examined a large number of birds; but it is to be regretted that he has apparently had no opportunity of investigating some of the most interesting forms, such as the Tinamidæ and Turnicidæ. Had Dr. Gadow been acquainted with the structure

* "Versuch einer vergleichenden Anatomie des Verdauungs-systemes der Vögel," I. Theil, Jen. Zeitschr. f. Wissenschaft., Band xiii. Heft 1, pp. 92–171 (1879); II. Theil, *tom. cit.* Heft 3, p. 339 &c. (1879).